

## CLAIMS

I claim:

1. An apparatus for treating golf ball surface comprising:
  - a sealed casing, the casing providing an electrode;
  - a tumbler rotationally disposed within the casing, the tumbler holding golf balls and having a plurality of perforated holes in a staggered pattern covering a substantial portion of the tumbler surface;
  - a plasma generation rod disposed within the tumbler, the rod providing another electrode;
  - an electric source for applying high voltage across the electrodes in order to generate plasma glow discharge; and
  - a dry vacuum pumping system for achieving low pressures within the casing, whereby the dry pumping system effectively seals the mechanical gears and bearings to isolate their lubricating oils from contact with the golf balls within the tumbler, thereby reducing impurities and improving print and paint adhesion of the golf ball surfaces.
2. The apparatus according to claim 1, wherein the dry vacuum pumping system is a two-stage system comprising:
  - a first stage creating a vacuum of about 1 torr within a viscous flow regime; and
  - a second stage creating a vacuum of about 10 milli-torr or less while operating within a molecular flow regime.
3. A method for treating a plurality of uncoated golf ball surfaces, the method comprising:
  - providing a sealed casing having a rotational tumbler disposed therein, the casing providing an electrode;
  - providing a plasma discharge rod disposed within the tumbler, the rod providing another electrode;

drawing with a dry vacuum system a vacuum of about 10 milli- torr or less within the sealed casing;

applying a high electrode voltage across the electrodes to create a plasma discharge within the tumbler;

placing a plurality of untreated golf balls within the tumbler; and

rotating the plurality of golf ball within the tumbler, for an even exposure of plasma discharge to all the golf balls therein,

wherein the dry vacuum system effectively isolates all lubricating oils from contact with the surface of the golf balls.

4. The method according to claim 3, wherein the dry vacuum system includes a two stage system, the first stage drawing a vacuum of about 1 torr and the second stage lowering that vacuum to about 10 milli-torr or less.